

Industrial

# Standardization

and Commercial Standards Monthly



March

Howard Coonley  
Heads Up WPB Simplification Work

1942

(See Article Page 53)

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# Industrial Standardization

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RUTH E. MASON, Editor

*Our Front Cover:*—Howard Coonley, chairman of the Board, Walworth Company; past-president, National Association of Manufacturers; past-president, American Standards Association. Photo by Newspictures.

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**Standardization is dynamic, not static. It means  
not to stand still, but to move forward together.**

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## Standards In War Production

"Contracts for standard and semi-standard articles relatively simple to make shall be placed with smaller concerns, so that the facilities of the larger, more fully equipped firms may remain available for production of more difficult and complicated items."

—Donald M. Nelson

In Directive Order No. 2 of  
the War Production Board

"One of the outstanding aids to management in its search for more efficient methods is the contribution of standardization.

"Standardization and the results of standardization had a large part in industry's outstanding performance during 1917 and 1918.

"An increased use of standardization may be our solution today."

—William L. Batt

Address at the Annual Meeting of the  
American Standards Association, 1938

# Howard Coonley Heads Up WPB Simplification Work

**H**OWARD COONLEY, former president of the National Association of Manufacturers and of the American Standards Association, was called to Washington early this month to coordinate and implement the simplification and standardization program of WPB. The division he heads will take its place in the administrative set-up of WPB as one of the branches of the Bureau of Industrial Conservation.

Mr. Coonley is taking a leave of absence from his duties as chairman of the Board of the Walworth Company and has accepted the WPB appointment for three months.

All simplification activities in WPB, including those involving industrial standards, will clear through Mr. Coonley's division. The work, it is planned, will be carried on in cooperation with the Industrial Advisory Committees established in the Division of Industry Operations. Close cooperative arrangements are planned with the standardization activities of WPB, OPA, the War and Navy Departments, and the Maritime Commission, and also with such agencies as the National Bureau of Standards, the American Standards Association, and the American Society for Testing Materials.

It is understood that the following are among the objectives of the Division:

1. To coordinate and strengthen efforts toward simplification and standardization within WPB and to bring about closer cooperation in these activities carried on within other defense agencies.
2. By concentrating on fewer lines which are most needed, to help industry speed up production through more economical and more intensive use of equipment, materials, and manpower.
3. To extend the use of standard materials, parts, products, and methods so as to facilitate subcontracting, local pool contracting, and the placing of orders with small firms.
4. To serve as a basis of WPB orders for conservation.
5. To serve as a basis of price orders for producer goods (OPA).

Donald M. Nelson, chairman of the War Production Board, has for months been urging the simplification of lines and products. In his Directive Order 2, eliminating competitive bidding in general for the duration of the war, he says: "contracts for standard and semi-standard articles relatively simple to make shall be placed with smaller concerns, so that the facilities of

## Branch of Conservation Bureau will coordinate WPB simplification and standardization activities

the larger, more fully equipped firms may remain available for production of more difficult and complicated items." Coordination of the government's simplification and standardization activities is expected to make the subcontracting problem less complicated, to contribute greatly to the speedy changeover of plants to war production, and to help in training workers for new jobs, and in facilitating interchange of tools and equipment.

The Bureau of Industrial Conservation is already engaged upon a program of intensive work on Government specifications to conserve scarce and critical materials. This work is under the Bureau's Specifications Division, which is headed by C. L. Warwick (secretary of the American Society for Testing Materials). This division is working very closely with defense services and with the Federal Specifications Executive Committee.

The Bureau also has an extensive program of salvage and substitution for scarce and critical materials.

Materials and products which are not directly covered by Government specifications, but which must be closely coordinated with them to bring about a nationally coordinated productive effort will be the responsibility of Mr. Coonley's Simplification Branch, it is planned.

Mr. Coonley's experience in the past has been ideal as a basis for the responsibility of organizing the nation's war standardization program. He has been an outstanding exponent of the use of standardization to increase production in peace and in war. In his company, in his industry, and in inter-industry relations he has been active in improving the productive process through effective standardization programs. In addition to the standards program of the Walworth Company, for which Mr. Coonley was responsible as president, he has been closely associated with the successful standardization program of the Manufacturers Standardization Society of the Valve and Fittings Industry. For some 20 years, Mr. Coonley has



been chairman of that society. His close affiliation with the development of standards in the pipe and fittings industry brought him into national prominence in the standardization program and in 1932 he was elected president of the American Standards Association. He was ASA president from 1933 through 1935, and is now chairman of the ASA Advisory Committee.

Of his experience with the use of standards he himself has said:

"After long experience in company operation, I have been more and more impressed with the fact that the use of effective standards is one of the most reliable tools an executive can have to reduce the pressure under which he lives. Standards cut down on the number of conferences that it is necessary to hold, on the number of misfires, on controversies in the operation of the plant, and on controversies with customers. In most cases this is brought about by solving problems in advance, so that they never come before the executive for his consideration. The advantages which my company has reaped from the extensive use that we have made of standardization could,

I believe, be summed up in the phrase, 'reducing things to simple routine.' It has cut down the pressure on executives from top to bottom of our company, releasing them from the necessity of making many minor decisions. In fact, standardization is a major key to administration. When a company has introduced a well-rounded program of sound standards for office, purchasing, and operating routine, as well as for engineering and shop practices, that company is well along toward an effective organization."

Mr. Coonley's appointment by the WPB opens to him an opportunity to apply the experience he has gained in performing for the national production program a service similar to that for which he has been responsible in the pipe and fittings industry.

During the last war, Mr. Coonley was Administrative Vice-President of the Emergency Fleet Corporation, and was a member of the War Labor Policies Board. The other four members of that Board were Felix Frankfurter, Franklin D. Roosevelt, Ernest M. Hopkins, and Hugh Frayne.

## Conservation Order Cuts Number of Can Sizes

**A** 40 PER CENT saving in tin used by the canning industry is expected to result from Conservation Order M-81, issued by WPB on February 11, 1942, which reduces the manufacture, sale, and use of tin cans. The Conservation Order limits the sizes of cans that may be used for various kinds of fruits and vegetables

and also limits the thickness of the plating permitted on the cans.

A tinplate coating of 1.25 lb per base box (31,360 square inches) is considered sufficient for the coating of cans under war-time conditions. Only for a few especially designated fruits and vegetables is a heavier coating (1.50 lb per base box) to be permitted. Some of these special fruits and vegetables include sauerkraut, pureed vegetables and fruits, berries, jams and jellies, pectin, and pickles.

The greatly reduced list of can sizes which may be used after March 1 eliminates the very small cans and in most cases permits only about two thirds the number of sizes recommended in Simplified Practice Recommendation R155-40, issued by the National Bureau of Standards. For example, the Order permits the use of No. 1 Tall, No. 2, No. 2½, and No. 10 cans for Fruit Cocktail and Fruits for Salad whereas the Simplified Practice Recommendation recommends 8Z Tall, No. 211 Cylinder, No. 1 Tall, No. 2, No. 2½ and No. 10 size cans.

In order to avoid the necessity for changing over equipment for the use of the required sizes, the Order provides that a canner who is not equipped to can his entire product in the sizes listed may use other stipulated sizes if he used those sizes in 1941, or he may use other larger sizes if those sizes are recommended for his product by Simplified Practice Recommendation R155-40.

The American Standards Association has just published a new list of American Standards. Nearly 500 standards are listed in a wide variety of engineering fields and in the fields of industrial and public safety. There is a separate heading for American Defense Emergency Standards—standards developed specifically for war production needs, and for the first time all American Safety Standards are listed together in a separate section.

This 1942 List of American Standards was circulated with the February issue of INDUSTRIAL STANDARDIZATION. Readers may, however, obtain additional copies, free of charge, by writing to the American Standards Association, 29 West 39th St., New York.

# ASA Approves Standard Mechanical Symbols For Uniform Use on Drawings

by R. L. Young

*Secretary, Subcommittee 1 on Symbols for Mechanical Engineering, ASA Committee on Graphical Symbols for Use on Drawings*

THE rapid growth of both mechanical and electrical systems in recent years, particularly in connection with expanding industries such as radio, aviation, streamlined transportation, air-conditioning and refrigeration, welding, and shipbuilding, has made it important to standardize immediately on the best symbols for use on specifications and drawings, before so much headway is made that change becomes difficult. This rapid growth, now vastly accelerated by Defense requirements, has resulted in the preparation of specifications and drawings on a scale never before approached in America or elsewhere.

One of the most important components of engineering drawings, which determines whether they are effective in translating the designer's intentions to the shop, is the system of Symbols.

## American Standards Being Coordinated

Approval by the American Standards Association of a new American Standard on Graphical Symbols for Use on Drawings in Mechanical Engineering (Z32.2-1941), the first standard completed by the ASA Committee on Graphical Symbols and Abbreviations for Use on Drawings (Z32), emphasizes the coordinating work now going forward rapidly under this committee's program.

In the past, symbols for drawings have been covered in many unrelated American Standards, which has acted against as great a degree of uniformity as seems practicable and desirable. Examples of such American Standards are:

- Z14.2-1935 Drawings and Drafting Room Practice—Graphical Symbols
- Z10g2-1933 Graphical Symbols for Electric Power and Wiring
- Z10g3-1933 Graphical Symbols for Radio
- Z10g5-1933 Graphical Symbols for Electric Traction including Railway Signaling
- Z10g6-1929 Graphical Symbols for Telephone and Telegraph
- Z10h-1930 Navigational and Topographical Symbols
- C10-1924 Symbols for Electrical Equipment of Buildings

**Mechanical symbols, just completed, are only one standard in a rounded program on graphical symbols going forward in ASA Committee Z32**

**Uniformity in use of drawing symbols would help to speed engineering work**

In addition to the above standards, which cover principally the symbols commonly used on drawings, there are other approved standards which also include such symbols, although to a lesser degree.<sup>1</sup>

During 1933 the broadening field, as well as a realization that some conflicts and lack of uniformity existed, led to the suggestion that a separate sectional committee might be organized to take over all the work on graphical symbols and abbreviations for use on drawings. This committee, it was suggested, could also revise the old standards and add such new symbols and abbreviations as might be required to serve new conditions and industries.

Conferences were held during 1933 and 1934 between the ASA Electrical Standards Committee, the sponsors (the American Institute of Electrical Engineers and the American Society of Mechanical Engineers), and the officers of the ASA sectional committees on Letter Symbols and Abbreviations

<sup>1</sup>A general standard covering Drawing and Drafting Room Practice (Z14.1-1935) has also been approved and is available from the American Standards Association at 50 cents per copy.

for Science and Engineering (Z10) and on Drawings and Drafting Room Practices (Z14). As a result of this work, the American Standards Association approved the new alignment in 1935, and a new committee was organized in June 1936. This new committee, designated Z32, was set up to standardize "Graphical Symbols and Abbreviations for Use on Drawings." To it were transferred the above-listed standards and similar work in process.

#### How the Z32 Committee Was Organized

Some 45 organizations are included in the work of this committee as shown in the box on page 58 with about 50 engineers and executives as representatives on the sectional committee, and an additional 50 experts selected for their special knowledge of subjects to be dealt with by working sub-groups.

H. W. Samson of the Standards Department, General Electric Company, was elected chairman, with W. L. Heard, Systems Staff Engineer, Bell Telephone Laboratories, secretary. The membership was divided into two approximately equal groups: Subcommittee No. 1 on Mechanical Engineering, and Subcommittee No. 2 on Electrical Engineering.

The Mechanical Subcommittee elected as chairman Dr. Thomas E. French, Professor of Engineering Drawing, Ohio State University, who is also chairman of sectional committee Z14 as well as chairman of the Editing Committee and of Subcommittee No. 6 which prepared the standard on Graphical Symbols for Drawings and Drafting Room Practice (Z14.2-1935) mentioned above. Two subgroups of the Z32 Mechanical Subcommittee were formed. Subgroup No. 1 on Welding is under the chairmanship of L. C. Bibber, Welding Engineer, Carnegie-Illinois Steel Company, who is chairman of the Symbols Committee of the American Welding Society. This subgroup includes the entire personnel of the Welding Society's Symbols Committee, with the addition of a few others not primarily connected with welding.

Subgroup No. 2 on Heating, Ventilation, Refrigeration, and Air-Conditioning is under the chairmanship of E. E. Ashley, Consulting Engineer, ably assisted by John James, Technical Assistant, American Society of Heating and Ventilating Engineers.

The Electrical Subcommittee, with Messrs Samson and Heard serving as chairman and secretary, organized six working subgroups and an editing subgroup, several of which have standards well advanced toward completion.

An additional Subcommittee on Abbreviations for Use on Drawings with Dr. French as chairman has been set up and is in process of formation.

The organization of the entire sectional committee is shown in the chart on page 57, which may be of interest as representing a typical ASA committee handling several specialized projects. It will be noted that the joint sponsorship of AIEE and ASME complement each other, AIEE supervising the standards which are principally electrical, while ASME has particular interest in the mechanical standards. Each subcommittee has both electrical and mechanical engineers in its membership, and they include many specialized engineers and draftsmen, designers, consultants, executives, contractors, metallurgists, chemists, trade association staff members, advertising managers and statisticians.

#### Standard Mechanical Symbols (Z32.2-1941)

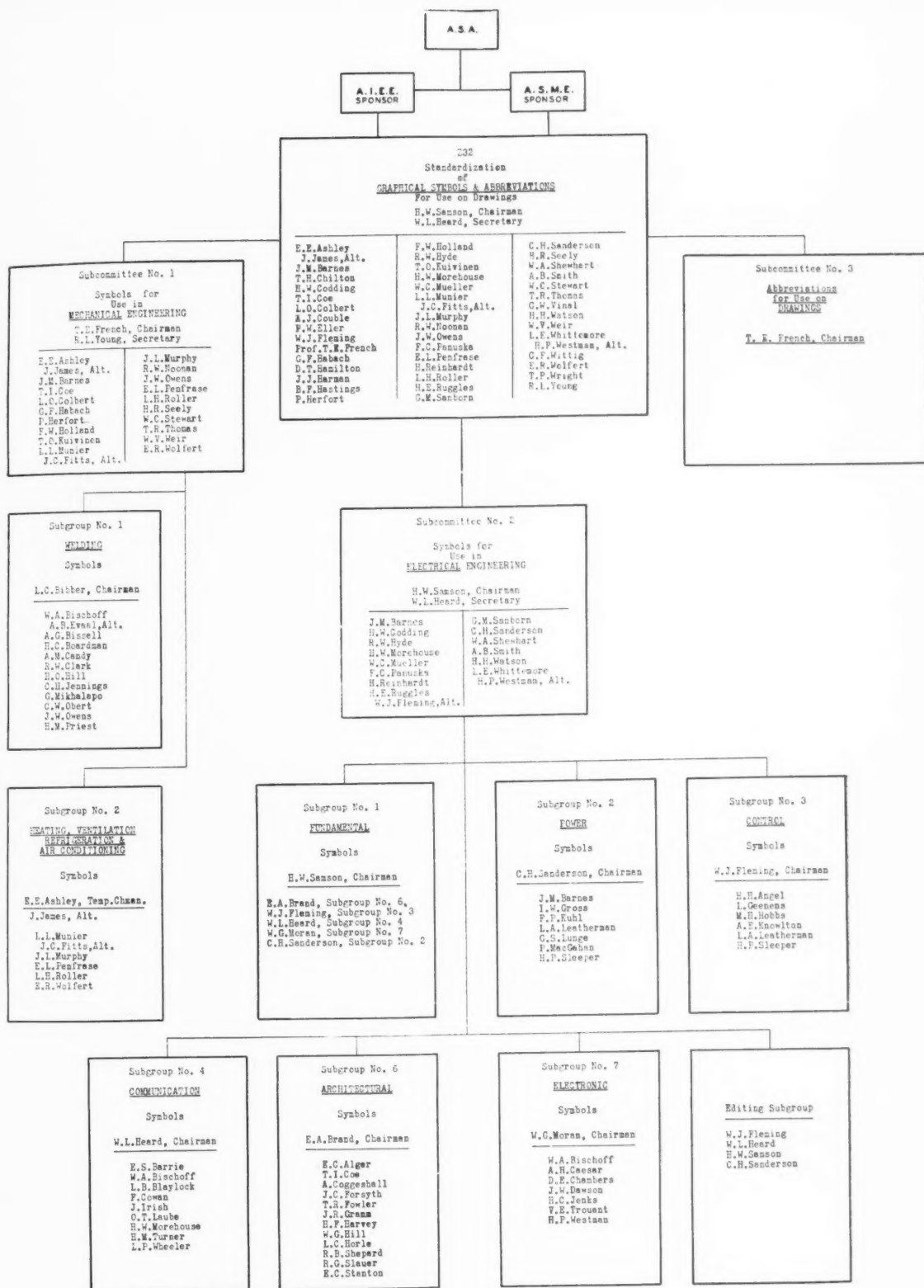
The new Standard on Graphical Symbols for Use on Drawings in Mechanical Engineering dates back in its inception to 1926 when a subcommittee was appointed to develop a set of Standard Graphical Symbols for use on drawings. This committee drew on various sources, including symbols proposed by the American Society of Heating and Ventilating Engineers and the National Association of Master Plumbers of the United States. As a result of its work, standard Z14.2-1935, Drawings and Drafting Room Practice, Graphical Symbols, was prepared and approved.

After organization of the Sectional Committee on Graphical Symbols and Abbreviations for Use on Drawings (Z32) this standard was transferred to the new committee. Work was begun immediately by Subcommittee No. 1 and its subgroups to bring the standard into line with best current practice and to add symbols on air-conditioning, sprinklers, pneumatic tubes, ductwork, refrigerating, and welding. The refrigerating symbols were developed by a committee of the Air Conditioning and Refrigerating Machinery Association which holds membership on the sectional committee, the Mechanical Subcommittee, and subgroup 2. The welding standards will be discussed later.

#### Plumbing Symbols

The first 47 symbols show plumbing equipment. The shape of the symbol, with added letters in many cases, aids in identification. It will be appreciated that most symbols for physical equipment are necessarily compromises between a picture graph approximating the actual outlines and a convention which can be made quickly and clearly on a drawing. To select the "happy medium" and show enough detail to aid recognition and at the same time place a minimum burden upon the draftsman is one of the duties of the committee. Since many prints are made





## 45 Organizations on ASA Committee on Graphical Symbols for Drawings

AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS  
(Sponsor)  
AMERICAN SOCIETY OF MECHANICAL ENGINEERS  
(Sponsor)  
AIR CONDITIONING AND REFRIGERATING MACHINERY  
ASSOCIATION  
AMERICAN GAS ASSOCIATION  
AMERICAN GEAR MANUFACTURERS ASSOCIATION  
AMERICAN INSTITUTE OF ARCHITECTS  
AMERICAN INSTITUTE OF BOLT, NUT AND RIVET  
MANUFACTURERS  
AMERICAN INSTITUTE OF CHEMICAL ENGINEERS  
AMERICAN INSTITUTE OF MINING AND METALLURGI-  
CAL ENGINEERS  
AMERICAN INSTITUTE OF STEEL CONSTRUCTION, INC.  
AMERICAN PHYSICAL SOCIETY  
AMERICAN SOCIETY OF CIVIL ENGINEERS  
AMERICAN SOCIETY OF HEATING AND VENTILATING  
ENGINEERS  
AMERICAN SOCIETY OF REFRIGERATING ENGINEERS  
AMERICAN SOCIETY OF SANITARY ENGINEERING  
AMERICAN TRANSIT ASSOCIATION  
AMERICAN WATER WORKS ASSOCIATION  
AMERICAN WELDING SOCIETY  
ASSOCIATION OF AMERICAN RAILROADS  
ASSOCIATED GENERAL CONTRACTORS OF AMERICA  
ASA ELECTRIC LIGHT & POWER GROUP  
ASA TELEPHONE GROUP  
COMPRESSED AIR INSTITUTE  
DIESEL ENGINE MANUFACTURERS ASSOCIATION  
ELECTROCHEMICAL SOCIETY, INC.  
HEATING, PIPING AND AIR CONDITIONING CONTRA-  
CTORS NATIONAL ASSOCIATION  
HYDRAULIC INSTITUTE  
ILLUMINATING ENGINEERING SOCIETY  
INSTITUTE OF THE AERONAUTICAL SCIENCES, INC.  
INSTITUTE OF RADIO ENGINEERS  
MANUFACTURERS STANDARDIZATION SOCIETY OF THE  
VALVE AND FITTINGS INDUSTRY  
NATIONAL ASSOCIATION OF BUILDING TRADES EM-  
PLOYERS  
NATIONAL ASSOCIATION OF MASTER PLUMBERS OF  
THE UNITED STATES  
NATIONAL CONFERENCE OF BUSINESS PAPER EDITORS  
NATIONAL DISTRICT HEATING ASSOCIATION  
NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION  
NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION  
SOCIETY OF AUTOMOTIVE ENGINEERS  
SOCIETY FOR THE PROMOTION OF ENGINEERING EDU-  
CATION  
U. S. DEPARTMENT OF COMMERCE  
U. S. COAST AND GEODETIC SURVEY  
UNITED STATES INDEPENDENT TELEPHONE ASSO-  
CIATION  
U. S. NAVY DEPARTMENT

from an average tracing and many people often use each print, care must be taken that over-simplification to aid in preparing the tracing will not cause more lost time in use than is saved in preparation.

To aid in referring to the symbols, each one is assigned a number, the first 59 numbers being allotted to Plumbing. This system permits the addition of twelve more symbols in the future without doubling up or going outside the group. Similar provision for expansion is used throughout. This is a desirable feature since American Standards are not considered fixed but each is subject to revision to keep pace with developments in the art.

### Piping Symbols

The series 60-129 includes piping, the following five classes each being in its own group: Heating, Air-conditioning, Plumbing, Sprinklers, and Pneumatic Tubes. The general plan is to use solid lines for the outgoing supply pipes and broken lines for the return. The most commonly used pipes, such as low-pressure steam or hot water, are not further identified.

Additional markings, such as short diagonal strokes or circles on some of the lines, further identify the materials carried by the pipes, but in most cases this identification is made by one or more letters; for example, —A— indicates compressed air line; ----CR---- indicates condenser water return; —B— indicates brine supply; ----BR---- brine return. Solid and broken lines are used without identification to symbolize pipes for different materials in different industries, this being permitted in order to avoid a multiplicity of symbols and also because it is felt that the associated fittings and the context or setting of the drawing will assist sufficiently to prevent confusion.

### "Conflicts" Must Be Harmonized

Such "conflicts" are matters requiring the best judgment of the committee, which found it necessary to take into account long-standing practices followed by the trades, uprooting of which might lead either to lack of acceptance of the standards or to introduction of more confusion than the good which a completely uniform standard might hope to accomplish.

The harmonizing problem arises frequently in both the Mechanical and Electrical Subcommittees and is known to experienced standardizers as one of those most difficult to handle. However, standardization is not the only field in which common sense, tact, and give-and-take can frequently evolve a satisfactory workable program, whereas insistence upon a theoretically more desirable plan would result in nothing being accomplished.

## Fittings Symbols

Pipe Fittings and Valves comprise a large group requiring four pages, since many of the symbols are shown in five variations to indicate whether the piping system is flanged, screwed, bell and spigot, welded, or soldered. The Heating and Ventilating section also includes these symbols but has an additional page showing nineteen symbols more particularly belonging to this division.

## Additional Sections

**Ductwork** starts with number 200 and comprises thirty symbols showing duct, register, grills, dampers, louvers, etc.

**Heat Power Apparatus**, 240-259, includes boilers, turbines, condensers, tanks, automatic valves and governors, pumps, and traps.

**Conventional Rivets** in plan and section are allotted 260-279.

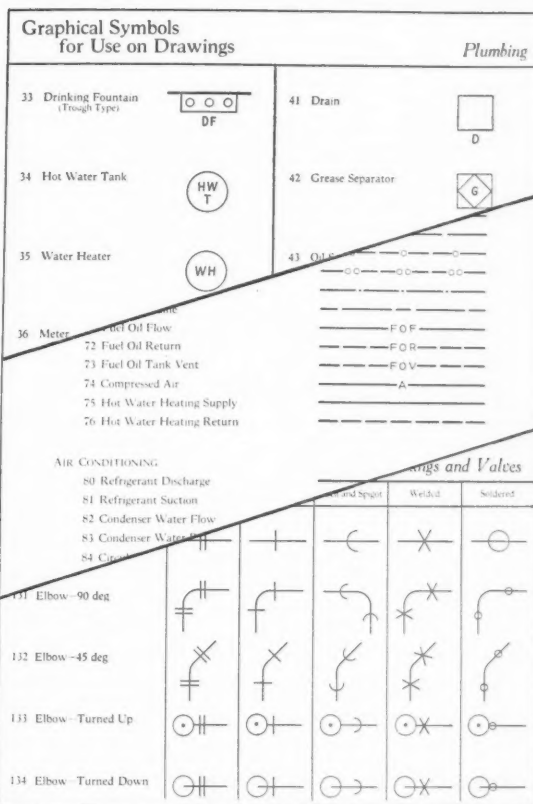
**Refrigerating**, starting at No. 280, includes 31 symbols and concludes the standard proper.

## Welding

Three keysheets on Welding are included in the standard as an Appendix, one covering Arc and Gas-welding, one Resistance-welding, and one showing location of welding information.

This Appendix is part of a much more complete standard, **Welding Symbols and Instructions for Their Use**, developed by the American Welding Society and revised by Subgroup No. 1 which has been studying it as a basis for an American Standard on Graphical Symbols for Welding.

It is expected that when completed and approved this standard will be issued as Z32.1. In the meantime it has been thought desirable to give advance publicity to the essential features of this welding standard because of the great



Sections of Typical Pages Showing Symbols for Plumbing, Piping, and Pipe Fittings and Valves

importance of welding in the vast and increasing Defense Industries, particularly in the fabrication of ships, airplanes, tanks, factories, and streamlined railway equipment.

## NCRC Sponsors Local Groups Of Retailers and Consumers

Under the leadership of the National Consumer-Retailer Council, a committee of Philadelphia consumer organizations and department, specialty, and food store executives has been formed as the first local group in a general program for retailer-consumer cooperation. The new program of cooperation between retailers and consumers through local groups is being developed to help iron out problems which may arise between consumers and retailers growing out of rising prices, rationing, changing qualities of merchan-

dise, and curtailed store services. This work ties in with the national program of the NCRC which has been responsible for wide acceptance of informative and grade labels recommended by the Council. These labels are now being used by many national retailers and retail food distributors, such as A & P and Sears-Roebuck, among others.

Co-chairmen of the new Philadelphia group sponsored by the NCRC are Arthur C. Kaufman, president of the Philadelphia Merchants Association and executive head of Gimbel Brothers, Philadelphia, and Miss Ardenia Chapman of the Philadelphia Home Economic Association and the Drexel Institute.

## OPA Announces Changes In Consumer Division

**E**XTENSIVE changes in the personnel of the Consumer Division of the Office of Price Administration have just been announced. Replacing Miss Harriet Elliott as head of the Division is Dr. Dexter Keezer, whose title is Assistant Administrator. Dr. Keezer, who is president of Reed College, was formerly Director of the Consumers Advisory Board of the NRA. Dan West continues to carry much of the responsibility for the administrative work of the Division under the title of Director of the Consumer Division.

W. S. MacLeod has been appointed chief of the Division's Standards Section, one of the chief functions of which is to recommend identifying standards or nomenclature for products as a basis for price control. It also maintains intimate cooperation with the WPB Division of Civilian Supply and Bureau of Industrial Conservation. Mr. MacLeod was formerly head of the standardization work of the Standard Oil Development Company, which is the technical subsidiary of the Standard Oil Company of New Jersey. He has had close contact with the national standardization

### Keezer Heads Division; MacLeod Has Charge of Standards Section

program through membership on many ASA committees, and through his work on the ASA Company Member Forum.

Dickson Reck continues as assistant chief of the Standards Section.

Dr. Robert A. Brady, formerly head of the Standards Section, is now general economic adviser to the Consumers' Division.

The staff of the Standards Section is working intimately with the commodity sections of the Office of Price Administration, one member of the staff being given special responsibility in connection with the work of each of the eight following sections: textiles, apparel, leather products; furniture and household furnishings; health supplies, food; fuels, chemicals, paints; containers, pulp and paper; automobiles, electric appliances, repair parts; rubber, rubber products; and building materials, plumbing, heating and ventilating.

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## Recent Changes on ASA Standards Council

New members and alternate members on the ASA Standards Council have been appointed recently by national associations and technical societies which are Member-Bodies of the American Standards Association and as such have a voice in ASA decisions on national standards. The ASA Standards Council makes all final decisions on approval of new projects and new standards.

The following members and alternate members have become members of the Council recently:

O. U. Cook, Tennessee Coal, Iron and Railroad Company, Birmingham, Alabama, was named by the American Iron and Steel Institute for a three-year period from 1942-1944. C. M. Parker, American Iron and Steel Institute; J. J. Shuman, Jones & Laughlin Steel Corporation; and T. G. Stitt, Pittsburgh Steel Company, are serving as alternate representatives.

Paul Arnold of the Agfa Ansco Division of General Aniline & Film Corporation has been appointed by the Photographic Manufacturers Group for the three-year period beginning January 1, 1942.

Dr. H. S. Osborne represents the American Institute of Electrical Engineers succeeding R. E. Hellmund. H. E. Farrer, R. E. Hellmund, and E. B. Paxton are the Institute's alternate representatives.

Colonel George D. Babcock, director of engineering management, Office of the Administrator, Federal Works Agency, succeeds W. E. Reynolds of the Public Buildings Administration as representative of the Agency.

S. P. Cobb, Ebasco Services, Inc., has been named by the American Gas Association as alternate representative. Robert G. Griswold, president, Electric Advisers, Inc., is AGA representative.

C. H. Bissell now represents the National Electrical Manufacturers Association, succeeding E. D. Youmans, to complete Mr. Youmans' unexpired term ending December 31, 1942. NEMA has also named W. H. Burleson, Ohio Brass Company, Mansfield, Ohio, to replace C. H. Bissell of the Crouse-Hinds Company, Syracuse, N. Y., as alternate representative.



# Standardization— Harmonizer of Human Effort

**M**EASUREMENT of physical things has been a useful intellectual tool of civilization; measurement of human values is now rapidly being developed and is becoming useful in solving problems of management.

In some of the activities primarily concerned with administration of personnel, standards have been developed and applied with notable success. I have selected as illustrations the standard systems developed by the Westinghouse Electric and Manufacturing Company in (a) job rating and grading of production workers, (b) position rating for office workers, (c) performance rating of office workers.

## Fitting the Right Man to the Job

There are three parts to the problem of fitting the right man to the right job in the factory,—job analysis, selecting (or training) the worker, and paying a just wage.

First is an adequate job analysis. The characteristics of the various jobs involved in a given industrial unit must be ascertained, listed, and evaluated. Successful production of goods by processes found to be best requires certain operations or types of work. The qualifications of a suitable worker for each may be different. Operation of a punch press, for example, could not best be done by a worker trained to use carpenter's tools, or by one not able to read, or by a man crippled by infantile paralysis. There are inherently certain factors of training or experience, of education, and of physique that go with the job. From the management angle rather than the social, therefore, our first task is to know in detail what nature of jobs we have in the manufacture of a product. We would not expect to find coil-winding jobs in a foundry.

Ten component criteria of personal qualifications have been selected as a basis for this job

NOTE: This article is abstracted from a paper presented during the Annual Conference of the Society for the Advancement of Management, December 5, 1941, in New York. The text reproduced here followed a brief introduction dealing with the use of standards for materials, interchangeable parts, engineering design, and manufacturing, and office methods.

by Dr. Douglas F. Miner

*George Westinghouse Professor of Engineering,  
Carnegie Institute of Technology*

analysis, each assigned a range of "point rating," as follows:

Item	Qualification	Point Range	Symbol
1	Basic Education	0—100	B
2	Experience required	0—100	E
3	Aptitude required	0—125	A
4	Physical application demand	0—40	P
5	Mental application demand	0—40	M
6	Visual application demand	0—40	V
7	Unusual demand	0—20	U
8	Responsibility for equipment	0—25	Eq
9	Responsibility for product	0—25	Pr
10	Responsibility for safety of others	0—25	S

This means that, for example, the difference between the maximum experience required (Item 2) and the minimum covers 100 points and a job that can be performed by a man of moderate experience might carry a point rating of 50 for this qualification. The point rating for each of the 10 qualities is estimated and the total added to give a figure known as job points. For example, an unskilled labor job may have a job point rating of 52 and a highly skilled tool-maker job might be rated at 300 or higher. Since the work of each plant is somewhat different, it is inadvisable to rate like-named jobs equally for all locations. The skill required for a drill press operation in one plant may be higher or lower

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**Standard methods for selecting the right worker for the right job help maintain efficiency both in the factory and in the office, Dr. Miner maintains. In this article he describes the methods used by the Westinghouse Electric and Manufacturing Company in job analysis and rating of workers**

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than the same operation in another part of the organization.

To serve as a guide toward just and uniform practices, certain commonly understood jobs are given ratings known as "anchor point" ratings. Local cases are compared to these standards and adjusted up or down as seems justified. The anchor point jobs are classified into Service Occupations (41 examples), Productive Occupations (68 examples), Inspection and Testing Positions (8 examples). Using these as a manual, any other specific job can be readily worked out. A few examples of anchor point ratings will show the principles involved. Note that part of the specification of a job is an adequate description.

1. *Service Job. Pipe Fitter, Grade A.* Lay out and install high-pressure steam pipe (50 lb or over), or power-house piping, refrigeration piping, accumulators, install pressure regulators and other controls. Work without direct supervision.

$B^* = 60, E = 80, A = 10, P = 25, M = 20, V = 5, U = 15, Eq = 5, Pr = 15, S = 0.$   
Total, 245 job points.

\* See Symbols in previous table

2. *Production Job. Painter, Grade B.* Ordinary brush or spray operations on large apparatus, cabinets, machine tools, motors, etc. Requires skill in applying lacquer.

$B = 25, E = 30, A = 0, P = 20, M = 5, V = 10, U = 5, Eq = 0, Pr = 5, S = 0.$   
Total, 100 job points.

3. *Inspection Job. Tester, Grade A.* Conduct experimental development and commercial tests on all types of complicated apparatus from engineering test specifications. Must be familiar with all types of electrical measuring devices, electrical circuits and test floor equipment. Make own test setups. High degree of responsibility for decisions on quality and performance.

$B = 100, E = 60, P = 10, M = 35, V = 10, U = 20, Eq = 15, Pr = 25, S = 15.$  Total, 300 job points.

The second step is the selection of employees. In filling specific jobs, selection can be made from employees already working or by hiring new employees. In the first case, reference to service records and personal knowledge of supervisors will lead to satisfactory judgment in most cases. Hiring new people successfully is helped by thorough inquiry into past training and experience and a checking of previous employers to establish personality traits. There is no sure formula but a sort of intuitive sense is often developed by employment interviewers.

An essential auxiliary of any system of selection in a large organization is a definite program

of training, especially for younger employees. By such a program both employee and employer are benefited. The Westinghouse program provides training of several types, covering factory positions which we are now considering, and office or salaried positions as well.

The third element of factory personnel administration is the establishment of equitable rates of compensation.

The first step here is determination of a scale of "labor grading." It has been found convenient to divide the range between the highest and lowest paid jobs into ten grades or classes. To provide proper differentiation, a percentage relation should exist between successive grades, 25 per cent being an acceptable increment, where the total range between top and bottom is sufficient. The labor grade number is directly related to the above-mentioned job point rating. For example, ten classes or grades with 25 per cent increments can be formed as follows:

Labor grade	Job point rating
1	300-up
2	240-299
3	193-239
4	155-192
5	124-154
6	99-123
7	79-98
8	63-78
9	50-62
10	up to 49

Referring to the jobs used for illustration, the pipe-fitter job would be in Labor Grade 2, the painter job in Grade 6, and the tester in Grade 1.

The next operation is making of a Key Sheet or Key Card for the plant or division involved. Definite brackets of hourly rates are thereby determined for the various labor grades from 1 to 10. A ratio is selected between the two ends of the scale, corresponding to the comparison of proper rates for the most skilled and least skilled job. Unless community standards would be violently disturbed, it is advisable to have this ratio as high as possible, for then a high incentive is provided for employees to attain the higher grade jobs either through experience or formal training. Encouragement of "up-grading" insures against excessive labor turnover. The rates paid for the ten grades successively overlap so that flexibility is provided to cover learners and experienced, efficient workers. Graphically the scheme may be shown as on the chart on the opposite page.

#### Salaried Position Ratings

Standardization is being applied to so-called "office workers." Usually we think of salaried

employees as "brain" workers doing a minimum of physical work. But this is not an adequate distinction, since many wage-paid jobs involve much higher level of mental activity than some clerical jobs. A statement of policy on this point eliminates misunderstanding. The salary method of payment (as defined for Westinghouse employees) is applied to those who manage, supervise, plan, provide for, or service the production workers, or engage in general duties of sales or administration.

The principles of job analysis might seem difficult to apply to office workers, particularly to creative work. The problem is different, to be sure, but lends itself to satisfactory solution. A pioneer in this field, Dr. E. B. Roberts, Assistant to the Vice-President of Industrial Relations, has developed guiding principles and a workable system which have been successfully applied throughout the Westinghouse organization and have been tested in other companies as well.

Westinghouse salaried positions are divided into seven groups of increasing responsibility. Here again the aim is first to define the essential positions and then place the individuals where they fit best. Each position has a range or bracket of allowable salary. For a man to merit a salary beyond the range in a given position involves exhibiting aptitudes for a higher classification. Except for limited flexibility, the salary goes with the position rather than with the individual.

The groups and group functions are:

**I. Unskilled.** The positions of this group, mostly clerical in character, require accuracy and dependability, but no extended training. Office boy, record clerk, and file clerk.

**II. Skilled.** The positions of this group, mostly clerical in character, require, in addition, training of hand or mind. The group includes such positions as stenographer, production clerk, detail draftsman, and ledgerman. Among the non-clerical positions of this group are laboratory assistant, power-plant operator, and demonstrator.

**III. Interpretative.** The positions of this group call for ability to classify work and apply established procedures toward its accomplishment. Many of the positions are clerical, such as correspondents; but others are non-clerical, such as foremen, laboratory assistants, and layout draftsmen.

In most positions of this group the work is non-supervisory in character, but in the highest positions of the group the work is supervisory and involves little or no substantial amount of work of the same kind as that done by those supervised. Illustrations are: chief clerk, office manager, foreman.

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The scale shows six rates of pay within Grade 1 (or any other), three of which form the lower rates for Grade 2. The advantage of a Key Sheet is that actual wages paid can be adjusted readily without disturbing the job analysis or point ratings. New values can be chosen for ratio of top to bottom grades or the whole list may be raised or lowered in any desired fashion to meet new economic conditions. But the work done in analyzing positions does not have to be done over unless a change in equipment or method is involved.

Scale showing overlap of pay rates in ten grades of jobs

**IV. Creative.** The positions of this group are those of creative character such as engineer, salesman, staff supervisor, attorney, system designer, and working group leader and section supervisor within these fields of activity.

**V. Executive.** The positions of this group are those of Department Manager, Local Sales Manager, Superintendent, General Foreman, and the Assistant Managers and Superintendents of large departments. The function is that of departmental management in the broad sense.

**VI. Administrative.** The positions of this group involve responsibilities of large magnitude or

overall character or for mixed functional divisions, such as Division Manager, District Sales Manager, of high order functional character, such as Accounting Director, Chief or Consulting Engineer, Director of Research, Treasurer, General Manager of Purchases & Traffic, and General Works Manager.

**VII. Policy.** The positions of this group are those of the senior elected policy officers of the Company.

It is essential to have uniformity in the designation of positions, particularly in the higher groups. Titles should mean the same in all plants or divisions. Definitions and rules have therefore been set down clarifying such titles and names as director, manager, superintendent, supervisor, division, department, section. For example:

**Department:** Applies to a closely knit, self-contained activity devoted to a specific function, presided over by a Manager, as:

Patent Department  
Industry Engineering Department  
Service Department  
Industrial Sales Department  
Mechanics Department, Research Laboratories

or a major activity of an operating division, as:

Stoker Department, Steam Division  
Porcelain Department, Switchgear Division  
Engineering Department, Small Motor Division

In the Salary Employment Manual furnished to executives, nearly 500 named positions are described, classified, and arranged in the seven major groups. Many of these, while having different names (e.g., Assistant Division Sales Manager and Assistant Industry Sales Manager) are equivalent in worth and are put under the same class number. This combining of similar jobs gives about 300 different classes of positions in the seven main groups. Each major type of activity with the company has its own named positions with a designating symbol. These segregations are:

Activity	Number of positions defined	Symbol
Clerical	86	C
Accounting	14	A
Advertising	5	Ad
Engineering	25	E
Publicity	5	Pb
Industrial Relations	19	I
Law and Patent	12	L
Sales	37	Sa
Service	12	Se
Manufacturing	36	W
Treasury	9	T
Purchases and Traffic	7	PT
Radio	16	R

Example descriptions of positions are selected from sales, clerical, and manufacturing activities:

**Salesman (4-Sa-4)\*** The duty is to secure profitable orders for the products of the Company from a prescribed list of customers with profit to the Company, and satisfaction to the customer with his continuing and increasing acceptance of the Company and its products. Essential to the adequate discharge of this responsibility are effective use of a knowledge of the products, knowledge of the customer's business and organization, knowledge of competitive products and activities, knowledge of credit standing of customers, adequacy of commercial service rendered, maintenance of prices, care in clerical work involved, economy in expenditures, as well as effective use of a knowledge of the art and practice of successful personal relationships and salesmanship. The Salesman is responsible for creative thinking directed toward the uncovering of new business, and in the study of, and report upon, business lost. He is responsible for reflecting back through the organization needs for the development of new products, or re-design of the old lines.

**Record Clerk (1-C-7)** Maintain master or index records of style numbers, style cards, sub-files, insurance cards, orders, requisitions, invoices, debits, journals, correspondence, negotiations, etc.

Issue number designations in accordance with instructions

Review records for correctness

File

**Works Manager (6-W-2)** The responsibility is for the profitable management of a Works. The discharge of this responsibility calls for a broad comprehension of the products with which engaged, the materials used, tools, the nature of the processes, the technical standards to be met, and the field conditions under which the products are applied. The Works Manager is responsible for the tone and character of the manufacturing organization, as reflected in its profit and loss statements, the adequacy of the service rendered by it, the harmony of its domestic relations, as well as its relations with the parallel functional organizations of Sales, Engineering, Accounting, Service, etc. These responsibilities are discharged through an effective leadership of Superintendents, and Works Manager's Staff Supervisors.

### Rating of Office and Supervisory Employees

In discussing position analysis, we have been concerned with defining and delineating the job itself, not with the employee who is to fit the position. Measurement of work is possible in relative, if not absolute, terms and presents much less difficulty than measurement of the worker. In the field of employee rating, no perfect standards of measurement are available, and the task changes from an objective to a subjective one. Performance of an individual may be satisfactory for one position but not for another; the work done by the office boy cannot be rated in the same terms as that of the vice-president.

Some systems of rating have listed qualities or characteristics and a rating on each is supposed to add up to a score indicative of the individual's worth. By qualities, we do not mean

\* The first figure designates group IV (creative); the letters = sales; the last figure, the fourth sales position defined.



## Westinghouse Rating Scale

### UNSKILLED

Office Boy  
Messenger  
Record Clerk  
File Clerk  
Dept Machines  
Operator

### INTERPRETATIVE

Cost Clerk  
Secretary  
Product Demon-  
strator  
Layout Draftsman  
Lab Supervisor  
Order Corres-  
pondent  
Chief Clerk  
Office Manager  
Sales Assistant  
Price Clerk  
Foreman  
T & M Analyst

### EXECUTIVE

Works or Dist  
Auditor  
Adv Manager  
Eng Managers  
Patent Manager  
Hdqtrs Dept Asst  
Sales Mgr  
Dist Industry  
Manager  
Local Territorial  
Sales Mgr  
Local Manager  
Dist Serv Mgr  
Works Supt  
General Foreman

### POLICY

Vice President  
Secretary of the  
Company  
Comptroller  
President  
Chairman

Is he on hand when needed?  
Does he understand instructions and retain them?  
Does he do his work with accuracy and dependability?  
Are his movements efficient?  
Is he skilled in his occupation?  
Does he require constant supervision?  
Does he respect confidence?  
Does he classify his work accurately?  
Does he set a good example in conduct, appearance and attitude?  
Does he recognize what is beyond his scope?  
Does he refrain from assuming too much authority?  
Does he carry through?  
Does he recognize conditions that need improving?  
Does he secure cordial response from those under his authority?  
Is he versed in the technique of his field?  
Is he original?  
Does he assemble facts, select essentials, and reach decisions?  
Does he accept leadership in the field of his work?  
Does he express opinion without apology?  
Does he show an instructive attitude toward those under him?  
Does he set a tempo for his own work and the workers under his charge?  
Does he recognize the difference between fact and surmise?  
How does he take his mistakes?  
Is he constantly searching for improvements and economies?  
Does he carry out plans?  
Does he plan ahead?  
Is he able to interpret meaning and intent and apply general instructions? (not bound by literal-mindedness)  
Does he delegate wisely, making clear-cut assignments?  
Does he keep his head?  
Does he give others full credit for their accomplishments?  
Is he consistent in his dealings?  
Does he take a determined stand on important matters?  
Does he develop harmonious, cooperative relations?  
How does he react to criticism?  
Can he coordinate?  
Does he do first the things of most worth?  
Has he humor and perspective?  
Can he yield graciously in compromise?  
Do his judgments inspire confidence?  
Can he negotiate differences and arbitrate clashes?  
Can he foresee conflict and minimize its damage?  
Has he a vision of achievement?  
Has he great ideals.  
Has he the gleam to vitalize them?  
Is he capable of thinking and acting on the plane of industrial statesmanship?  
Does he exhibit that well integrated personality that gives others confidence in him?  
Has he inner resources of vast physical and mental energy and endurance?  
Has he courage in defeat?

### SKILLED

Time Clerk  
Stenographer  
Tracer  
M-I Clerk  
Detail Draftsman  
Lab Assistant  
Power Plant Engr  
Ledgerman  
Production Clerk  
Secy-Steno

### CREATIVE

Copy Writers  
Acctg Section  
Supervisors  
Engineer-Design-  
Research  
Attorney at Law  
Patent Attorney  
Salesman  
Headquarters Sec-  
retary Sales  
Supervisor  
Field Service Engr  
Credit Corre-  
spondent  
Collection Corre-  
spondent  
Manager Engi-  
neering

### ADMINISTRATIVE

Acctg Director  
Asst to Vice-Pres  
Chief Engineer  
Dir of Research  
General Attorney  
District Manager  
Hdqtrs Dept Sales  
Manager  
Treasurer  
Credit Manager  
Gen Works Man-  
ager

such traits of character as honesty, integrity, or sobriety. These are assumed to be essential to success in any position. The qualities usually chosen for a "high," "good," or "poor" grading include such terms as cooperativeness, loyalty, dependability, initiative, aggressiveness, punctuality, efficiency, accuracy. The hope is that a careful rating on each of these "properties" will give the answer. Results of such a method are usually disappointing and no two people agree on ratings. A modification, sometimes used, is the comparison of people with respect to a given characteristic. Several persons are to be rated relative to each other on "aggressiveness" for example. Or a known individual is used by all raters as a standard. Others are judged better or worse than he.

The important fact to be ascertained is how well an employee does his work and how qualified to undertake a higher grade. In other words, performance, not attributes, is what we seek to measure. We want to treat the man as a whole and not an assembly of component parts. Emphasis on the separate elements may be possible where definite tasks are to be performed but are of little use where responsibility is a major requirement. As we go up the scale of positions, we progress from *tasks* to *duties* to *responsibilities*. These three cannot be measured by the same yardstick. An employee who is perfect in performing tasks may be wholly unsuited to assume responsibilities in the management sense.

Instead of searching for a point rating of individuals in certain attributes, the Westinghouse system seeks the answers to questions about how the employee does his job. A list of questions has been prepared covering the seven groups of skills, graded according to the position involved.

At the lower end the questions are simple such as "Is he on hand when needed?", applicable to a messenger. This is in the region of *tasks*. In the *duty* bracket of positions we ask pointedly, "Is he versed in the technique of his field?" When we proceed to the *responsibility* group, we find such questions as "Has he a vision of achievement?"

The use of such a set of questions is simple. The rater asks himself each of the half dozen questions about an individual of a certain class or group and marks + if superior, a check mark if nothing to note, and — if inferior in performance. These marks are not totalled but are easy to compare with similar marks made for other individuals doing similar work or considered for the same position.

This system transfers emphasis from qualities to actions and is based on the belief that expression or evidence of worth appears in right action on the job. We measure ends and results rather than means and methods.

These illustrations of Westinghouse standardization applied to jobs and people that fill them are evidences of a plan to conserve, coordinate, and harmonize human effort. These examples are only a few of many. It is appreciated that conflicts are avoided if duties and privileges are well defined. Each employee wants to feel sure just what his job includes and to whom he is responsible. Indefiniteness of instructions leads to dissatisfaction, controversy and a feeling of insecurity. For several important functions, therefore, detailed instructions, procedure, and rules have been drawn up. Among these might be mentioned the Sales Manual, the Accounting Manual, the Shop Rule Book, and the Office System Manual.

## WPB Plans Standardization For Paper Weights and Sizes

A comprehensive program for simplification, standardization, and reduction in basis weight of "coarse papers and/or printing paper" has been proposed by WPB for consideration early in March. Kraft wrapping paper manufacturers are being asked to reduce the number of weights and sizes drastically. Book paper manufacturers were asked to make no more than two different grades of English (machine) finish book papers, supercalendered book papers, eggshell (antique) book papers, etc. Makers of rag content bond papers, ledger papers, onion skin, manifold papers, cover papers, sulphite bond papers, bristol boards, grocery bags and sacks, wrapping

tissue, gummed sealing tape, vegetable parchment, and butcher papers were all asked to curtail their lines. If this program goes through it is estimated that the total number of weights and sizes of paper will be reduced from 10,178 to 1,968, with a saving of about 175,000 tons of pulp.

## American Standards for Bolts and Nuts Are Considered as Australian Standard

The American Standard Wrench Head Bolts and Nuts and Wrench Openings (B18.2-1940) and American Standard Screw Threads for Bolts, Nuts, Machine Screws and Threaded Parts (B1.1-1935) are being considered for adoption as Australian emergency standards.



The Sorel building in process of construction. At the right of the picture a ceiling section is being dropped into place.

## Four-Inch Building Unit Is Success In Canadian Prefabrication Project

**D**IMENSIONAL coordination of sizes of building materials, one of the most recent of the standardization projects undertaken under the auspices of the American Standards Association, has already made its mark in the building field. As a result of a demonstration project carried out at Sorel, Quebec, for the National Housing Administration of Canada, other building projects for the Canadian Government are now going forward on the basis of the four-inch design. This four-inch unit is the increment decided upon by the committees of ASA Project A62 as a basis for their work of coordinating building dimensions with sizes of building materials.<sup>1</sup>

When a two-story building was needed by the Canadian Government to house a staff of some 140 inspectors attached to war industries at Sorel,

<sup>1</sup>The work of the committee is described in detail and examples of coordination are given in a report of the project now available from the American Standards Association without charge.

Used by ASA Committee A62 in its work on coordination of building materials, the unit is adopted in Canadian experiment, and helps cut down time and expense in construction of large Canadian building

Quebec, the National Housing Administration of Canada turned to prefabrication as an answer to the demand for speed. To help further in simplifying the procedure, the plan of the building was based on multiples of four inches as provided in the A62 report. This demonstration of the work of Committee A62 was encouraged through the interest of the Director of the National Housing Administration, F. W. Nicolls.



Here a ceiling unit is being hoisted. Other ceiling units are piled in the foreground.

who, as a representative of the Canadian Engineering Standards Association on the A62 Committee, was familiar with the work of the committee. Although the method had been applied to many small houses and buildings, the Sorel staff house was the first large building for which it had been used. When the decision to use the four-inch increment was made, the original building design and layout, prepared on the basis of ordinary production by the Canadian National Housing Administration, was made to conform to the four-inch method with very slight and minor changes, those in charge of the project report.

The fabrication by means of the new method showed substantial savings in time and labor, all reports indicate. For example, with this method, the simple four-inch jiggling made it possible to cut wood-frames to length with speed and precision and the layout of the building provided the coordination of building dimensions with these lengths of frame members. As an overall job of substantial size, it is claimed to have set a new time record for shop performance, as well as for erection.

#### Wood Frame Was Precut

The building itself has two stories, is E-shaped, 140 feet-8 inches long by 84 feet-8 inches wide, 280,000 cubic feet in all, and has a full basement. All wall units, inner and outer, ranging from 8 to 16 feet in length as required, were delivered to the job with both faces complete, and with door and window openings let in. Thus all inner walls, when in position, were ready for painting. The wood frame was completely precut.

Walls and ceilings were assembled in sections

in a temporary shop, a converted warehouse shed located at Lachute, Quebec.

The erection of the building at the site was accomplished in seven working days, including installation of all windows and entrances, interior doors on first floor, and oakum calking around all openings. The wall sections were erected at the rate of one every five minutes. The total man-hours for walls, ceilings, and roof amounted to 2,570; while the total man-hours for field labor amounted to 6,670.

It was reported that the precision of the various sections was such that no after adjustments of any kind were necessary. Just to be safe, the builders insisted on a tolerance of  $\frac{1}{16}$  inch on the lengths of all sections. This resulted in accumulating  $\frac{5}{8}$  inch along the run of straight wall 140 feet-8 inches long in which 12 joints between sections occurred.

It was noticeable, those in charge report, that all conventional operations, such as wood flooring and roofing, seriously hampered the progress of the work.

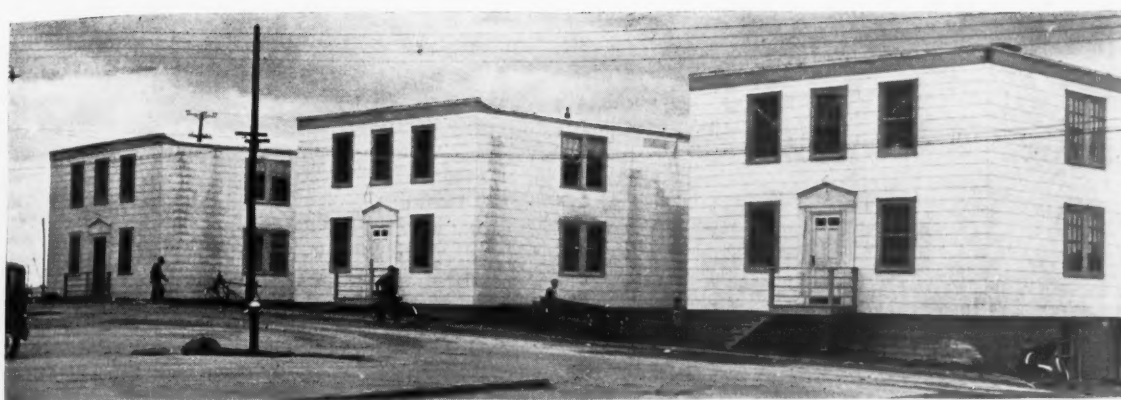
As a guide in carrying out the prefabricating technique, all schedules, plans, specifications, materials, and minute details of layout were carefully compiled in a shop book. So carefully were shop and delivery schedules planned that by the time the building was under roof, with exterior and interior walls in place, the plumbing and heating risers and attachments were in position, hardwood floors laid and stairs, windows, doors, and electrical wiring installed. The

"The idea of a unit system, or 'module,' or 'dimensional increment' for building design is not an abstraction which has been artificially introduced from outside the building industry; it is inherent in the building process itself. . . .

"The virtues of the four-inch module in traditional planning and construction can hardly be denied. Its multiples neatly encompass bricks and 2 x 4's, 16 in. stud spacings, and 4 ft wallboard widths. It is a small enough size increment for doors and windows, yet large enough to eliminate unneeded variety. Together with standardized assembly details, which Project A62 is rapidly developing, it offers much in convenience to the designer, economy to the builder, and systematic standardization to the materials manufacturer."

—Architectural Forum, November, 1941.





The completed two-story staff house at Sorel, Quebec.

foundation called for 385 cubic yards of concrete and this was poured in one day.

The saving in time due to the coordination of the building details and dimensions was found to be a help by many of the subcontractors as well as the general contractor. "It was indeed very interesting to note the speed with which the house was erected," declared the contractor in charge of the electrical work in a letter after the work was completed. "For a usual building of the sort, it requires three times more time and four times more men. It was at least a four-month job, but in two days the building was ready for occupancy; and instead of twelve men at work, three men were enough. . . ." The plumbing contractor remarked, "The plumbing and heating system can be installed in a record time and at a cost lower than ordinary construction."

The contractor himself declared, following the completion of the job: "From the experience that we have had in conventional construction, ranging from the erection of summer cottages to \$50,000 residences, and also including some

industrial plant work, it is our experience that the use of a four-inch increment as the basic layout for building design and construction permits us to do a more efficient job of construction and in a more economical manner than the former conventional method used.

"From the experience we have had on the Sorel job, where we used the four-inch increment exclusively, I can only hope we will not be obliged to revert to the conventional method of construction. With the use of this method of design, . . . we have proved that buildings of such design, as well as houses, can be erected much more quickly and at lower cost."

On the basis of his experience with this large building at Sorel, the contractor has built a permanent shop for prefabrication, using the methods of 4-inch jig cutting and assembly which are made possible by the 4-inch increment and coordinated assembly details. By competitive bidding on various government war emergency projects he has been able to take profitable business sufficient to keep his new plant going to full capacity.

## ASA Is Asked to Recommend Stresses for Structural Steel

A request from the Bureau of Industrial Conservation that the American Standards Association "undertake the development of recommendations to the War Production Board for higher allowable design stresses for structural steel" as a means of conserving the use of steel is now being considered by the ASA. The request also calls for "recommendations with respect to the design of steel structures that will conserve the use of steel . . . consistent with factors of safety that are reasonable in the present war emergency."

An ASA committee on Building Code Requirements for Iron and Steel is now working on requirements for structural steel and its work may be used as a basis for the recommendations suggested by the Bureau of Industrial Conservation.

C. W. Warwick, chief of the Specifications Branch of the Conservation Bureau, will be in charge of the work for the Bureau, and H. L. Whittemore of the National Bureau of Standards will be assigned to the Bureau as consultant on the subject of stresses.

# Standards Issued by Associations and Government

(See "ASA Standards Activities", page 78, for new American Standards and progress on ASA projects)

Since the publication of the February issue of *INDUSTRIAL STANDARDIZATION*, the ASA Library has received for its classified files copies of standards and specifications from the organizations listed below.

These standards may be consulted by ASA Members at the ASA Library.

Anyone desiring copies for his own use should write direct to the organization issuing the standard.

## Associations and Technical Societies

### American Institute of Electrical Engineers (33 West 39 Street, New York)

Capacitance Potential Devices and Outdoor Coupling Capacitors (Proposed AIEE Standard for trial use) No. 31, Dec 1941 No charge

Single-phase Motors, AIEE Proposed Test Code No. 502, Nov 1941 No charge

Wet Tests, Standard for No. 29, Nov 1941 40c

### American Society of Mechanical Engineers (29 West 39 Street, New York)

Welding Qualifications, Section IX ASME Boiler Construction Code 1941 ed 65c

### American Society for Testing Materials (260 South Broad Street, Philadelphia, Pa.)

Electrical Insulating Materials, ASTM Standards Dec 1941 \$2.25

### Copper & Brass Research Association (420 Lexington Avenue, New York)

Set of 25 standards in binder, including tolerances for flat rolled products (FRP-1; FRP-2; FRP-3; FP-4; FP-5); tolerances for drawn rectangular wire, strip, and bar (FP-6); diameter tolerances for rod and wire and for rod and bar (ROD-1; ROD-2) tolerances for round seamless tubes (TUBE-1; TUBE-2); dimen-

### Copper and Brass Research Assn.—(Continued)

sions and weights and tolerances for copper water tube, copper and brass pipe, and condenser and other heat exchanger tubes (TUBE-3; TUBE-4; TUBE-5); estimating data for condenser and other heat exchanger tubes (TUBE-6, 7, and 8); terminology and definitions (TERM-1; TERM-2 to 8 inc); and data giving decimal equivalents in inches for various gauges; use of weight tables; weights of flat products in pounds per linear foot; and weights of tubes in pounds per linear foot (DATA-1 through 12; and DATA-47 through 67 inc).

### Manufacturers Standardization Society of the Valve and Fittings Industry (420 Lexington Avenue, New York)

Spot Facing Standard MSS "Standard Practice" SP-9-1942 (For incorporation in MSS Binder)

### National Electrical Manufacturers Association (155 East 44 Street, New York)

Magnet Wire Standards, Supplement No. 41-69 Dec 1941 30c

Wire and Cable, Type Letter Designations No. 41-70 Dec 1941 50c

### Underwriters' Laboratories, Inc. (207 East Ohio Street, Chicago, Ill.)

Outlet Boxes and Fittings, Standard for

## United States Government

### National Bureau of Standards (Washington, D.C.) Simplified Practice Recommendations

Approved by Standing Committee and Circulated to Industry

Bell-Bottom Screw Jacks (four-way head type) Revision of R97-30

In Print (Copies available from Superintendent of Documents, Government Printing Office, Washington, D.C.)

Food Service Equipment R182-41

### Federal Specifications Executive Committee (U. S. Treasury Department, Washington, D.C.)

#### Federal Specifications

(Copies available from Superintendent of Documents, Government Printing Office, Washington, D.C.)

The date after the title of the specification indicates when it becomes effective.

Aggregate: (for) portland-cement-concrete (superseding SS-Z-281) SS-A-281a April 15, 1942

- Aluminum-alloy (AL-24) (Aluminum-copper-magnesium (1.5 per cent)-manganese); plates, sheets, and strips QQ-A-355a May 15, 1942
- Aluminum-alloy: ingots (Amendment 1) QQ-A-371a April 1, 1942
- Aluminum-Base-Alloy
- Die casting (Amendment 1) QQ-A-591 April 1, 1942
- Permanent-mold-castings (Amendment 1) QQ-A-596 April 1, 1942
- Sand-castings (Amendment 2) QQ-A-601 April 1, 1942
- Apricots: fresh (superseding Y-A-621) Y-A-621a April 1, 1942
- Bands: rubber (Amendment 2) ZZ-B-111 May 1, 1942
- Beans
- Lima: fresh (superseding HHH-B-141) HHH-B-141a April 15, 1942
- Snap (green or wax): fresh (superseding HHH-B-156) HHH-B-156a April 1, 1942
- Beds, Hospital: adjustable-spring-bottom (Amendment 2) AA-B-211b April 1, 1942
- Boxes, bread: hinged-type (New) RR-B-623 May 15, 1942
- Broccoli: fresh (superseding HHH-B-691) HHH-B-691a April 15, 1942
- Brushes
- Paint: metal-bound, flat (utility-wall) (New) H-B-436 April 1, 1942
- stencil (flag ends preserved) (Amendment 1) H-B-626 May 15, 1942
- Varnish:
- flat H-B-696 April 15, 1942
- oval (New) H-B-711 April 15, 1942
- Cabbage: fresh (superseding HHH-C-26) HHH-C-26a April 1, 1942
- Cable and Wire: rubber-insulated, building-type (0 to 5,000-volt service) (superseding J-C-101b and J-C-106a) J-C-103 April 1, 1942
- Cards:
- guide, calendered (file size) (New) UU-C-86 May 15, 1942
- index (superseding UU-C-111, UU-C-116, and UU-C-126) UU-C-128 May 15, 1942
- Catsup: tomato (Amendment 1) JJJ-C-91a April 2, 1942
- Cauliflower: fresh (superseding HHH-C-101) HHH-C-101a April 15, 1942
- Celery: fresh (superseding HHH-C-191a) HHH-C-191b April 15, 1942
- Cement
- Portland, high-early-strength (superseding SS-C-201) SS-C-201a May 1, 1942
- Portland, Pozzolana (superseding SS-C-208) SS-C-208a May 1, 1942
- Chili Con Carne: plain or with beans (New) EE-C-281 April 1, 1942
- Chinaware: vitrified (Amendment 2) M-C-301 April 15, 1942
- Copper: bars, plates, rods, shapes, sheets, and strips (Amendment 1) QQ-C-501a June 1, 1942
- Copper-Silicon Alloy: bars, plates, rods, shapes, sheets, and strips QQ-C-591a April 15, 1942
- Corn, Green: fresh (superseding HHH-C-591) HHH-C-591a April 15, 1942
- Crabmeat: fresh (Amendment 1) PP-C-656 April 15, 1942
- Crackers and cookies (Amendment 3) EE-C-651a May 15, 1942
- Denture-Base-Material (acrylic resin or mixtures of acrylic and other resins) (New) U-D-226 March 1, 1942
- Detergents, Special: (for aluminumware, dishwashing-machines, and manual cleaning) (New) P-D-236 April 15, 1942
- Disinfectors: steam-jacketed (New) GG-D-416 April 15, 1942
- Dispensers: soap (superseding FF-D-396a) FF-D-396b April 15, 1942
- Extracts, Flavoring: and flavors, non-alcoholic (superseding EE-E-911) EE-E-911a March 1, 1942
- Ferrochromium (superseding QQ-F-151) QQ-F-151a May 1, 1942
- Ferromanganese (superseding QQ-F-161) QQ-F-161a May 1, 1942
- Ferrosilicon (superseding QQ-F-181) QQ-F-181a June 1, 1942
- Ferrotitanium (superseding QQ-F-191a) QQ-F-191b May 15, 1942
- Ferrovanadium (superseding QQ-F-201a) QQ-F-201b May 15, 1942
- Filler, Expansion-Joint, reformed; nonextruding-bituminous-fiber-type (for concrete) (New) HH-F-334 April 15, 1942
- Fowl: dressed (fricassee) (Amendment 2) PP-F-611a April 1, 1942
- Fuses, Cartridge: enclosed, renewable (fusible links not separately enclosed); and renewal-links therefor (superseding W-F-803) W-F-803a March 15, 1942
- Glue: liquid (New) C-G-463 May 1, 1942
- Grapefruit-juice: canned (New) Z-G-686 June 1, 1942
- Grapes: fresh (superseding Y-G-671) Y-G-671a April 1, 1942
- Ink: writing (Amendment 2) TT-I-563a April 1, 1942
- Kits (empty), First-Aid, Burn-Treatment, and Snake-Bite: and Kit Contents (New) GG-K-391 April 15, 1942
- Leather: sole (cut, outer, and top-lift), vegetable-tanned, factory (superseding KK-L-261a) KK-L-261b May 1, 1942
- Lemons: fresh (Amendment 1) Y-L-231a June 15, 1942
- Lettuce: fresh (superseding HHH-L-226) HH-L-226a April 1, 1942
- Machines, Floor-Polishing and Scrubbing: electric (superseding W-M-46) W-M-46a March 15, 1942
- Nickel-Copper-Alloys: forgings, plates, rods, shapes, sheets, strips, and wire (Amendment 1) QQ-N-281 May 1, 1942
- Oil: neat's-foot (New) C-O-388 June 1, 1942
- Onions
- Bermuda, fresh (superseding part of HHH-O-531) HHH-O-532 April 15, 1942
- Creole, fresh (superseding part of HHH-O-531) HHH-O-534 April 15, 1942
- northern-grown type fresh (superseding part of HHH-O-531) HHH-O-536 April 15, 1942
- Oranges: fresh (California and Arizona) (Amendment 1) Y-O-660 June 15, 1942
- Outlet-boxes: steel, cadmium or zinc-coated, with covers and accessories (Amendment 1) W-O-821a April 15, 1942
- Pads: heating, electric (New) W-P-66 May 15, 1942
- Paint, varnish, lacquer, and related materials: general specifications (methods for sampling and testing) (New) TT-P-141 Feb 2, 1942
- Paper: teletype, roll and tape (superseding UU-P-547a) UU-P-547b May 15, 1942
- Peaches: fresh (Amendment 1) Y-P-151a June 15, 1942

Plums and Prunes; fresh (superseding Y-P-506) Y-P-506a April 15, 1942

Potatoes; sweet, fresh (superseding HHH-P-621) HHH-P-621a April 15, 1942

Rules (Amendment 1) GGG-R-791 May 15, 1942

Shelving; steel, storage (Amendment 1) AA-S-271a April 1, 1942

Skins; chamois (Amendment 2) KK-S-416 April 15, 1942

Soap, Toilet; floating, white (superseding P-S-616) P-S-616a April 15, 1942

Sodium-thiosulfate (hyposulfite) technical (New) O-S-616 June 1, 1942

Solder; silver (Amendment 2) QQ-S-561b Jan 1, 1942

Spiegeleisen (superseding QQ-S-611) QQ-S-611a May 15, 1942

Spinach; fresh (superseding HHH-S-616) HHH-S-616a April 15, 1942

Steel; castings (superseding QQ-S-681a) QQ-S-681b April 15, 1942

Terneplate (roofing tin) (Amendment 1) QQ-T-201 April 1, 1942

Tomatoes; fresh (superseding HHH-T-576) HHH-T-576a April 1, 1942

Tubing, aluminum-alloy (A1-61), (aluminum-magnesium-silicon); round seamless (New) WW-T-788 April 15, 1942

Turnip Greens; canned (New) JJJ-T-806 April 15, 1942

Varnish  
asphalt (Amendment 2) TT-V-51 April 1, 1942  
interior (Amendment 1) TT-V-71a April 1, 1942  
mixing (for) aluminum paint (Amendment 1) TT-V-81a April 1, 1942  
rubbing, cabinet (Amendment 1) TT-V-86 April 1, 1942  
spar, water-resisting (Amendment 3) TT-V-121a April 1, 1942

Veal (Amendment 1) PP-V-191a April 1, 1942

Watermelons (superseding Y-W-191) Y-W-121a April 1, 1942

Wire, steel; Bookbinders' (New) QQ-W-414 April 1, 1942

#### Emergency Alternate Federal Specifications

Bandages; plaster of paris E-GG-B-101a Feb 17, 1942

Boxes  
fiber, corrugated E-LLL-B-631a Jan 24, 1942  
fiber, solid (superseding E-LLL-B-636a, Jan 20, 1942) E-LLL-B-636a Feb 11, 1942  
wood-cleated-fiberboard E-NN-B-591 Jan 30, 1942  
wood-cleated-plywood (superseding E-NN-B-601a, Jan 14, 1942) E-NN-B-601a Jan 22, 1942

Brooms  
corn E-H-B-51 Feb 17, 1942  
whisk E-H-B-101 Feb 17, 1942

Brushes  
fitch, flat E-H-B-241 Feb 17, 1942  
flowing, skunk-hair E-H-B-256 Feb 17, 1942  
glue, flat E-H-B-291 Feb 17, 1942  
glue, round E-H-B-301 Feb 17, 1942  
lacquering, flat E-H-B-351 Feb 17, 1942  
marking E-H-B-371 Feb 17, 1942  
mottling E-H-B-391 Feb 17, 1942  
stencil (flag ends cut) E-H-B-621a Feb 17, 1942  
sweeping, floor, hair E-H-B-651 Feb 17, 1942

Calendar-pads and stands E-GG-C-101a Jan 28, 1942

#### Emergency Alternate Specifications—(Continued)

Cans; tinned-plate friction-covers E-RR-C-96

Cans  
oil (typewriter) E-RR-C-87 Feb 16, 1942  
tinned-plate, friction-covers E-RR-C-96

Clips; paper, wire E-FF-C-436 Jan 24, 1942

Combs; rubber (hard) E-ZZ-C-551 Feb 4, 1942

Cushions; chair, sponge-rubber E-ZZ-C-766 Jan 22, 1942

Erasers; steel E-GG-E-671 Jan 28, 1942

Fasteners; paper, brass E-FF-F-101 Jan 24, 1942

Flashlights; electric, hand (without batteries) E-W-F-421a Feb 4, 1942

Hose, Fire;  
cotton-rubber-lined (superseding E-ZZ-H-451a, Dec 31, 1941) E-ZZ-H-451a Jan 30, 1942  
linen, unlined (superseding E-JJ-H-571, Aug 7, 1941) E-JJ-H-571 Feb 9, 1942

Lamps; electric, incandescent, large, tungsten-filament (1942 supplement) E-W-L-101d

Machines, Dishwashing; and Dishbaskets E-OO-M-31a Jan 30, 1942

Machines, Floor-Polishing and Scrubbing; electric E-W-M-46a Jan 30, 1942

Machines, Numbering  
automatic, hand-operated E-GG-M-61 Jan 24, 1942  
lever-type E-GG-M-71 Jan 24, 1942

Pads; memorandum E-UU-P-21 Jan 28, 1942

Paper  
computing-machine E-UU-P-185 Jan 28, 1942  
general specifications E-UU-P-31a  
mineograph (superseding E-UU-P-388a, October 23, 1941) E-UU-P-388a Jan 22, 1942

Pencils, lead (superseding E-SS-P-166, Nov 28, 1941) E-SS-P-166 Jan 22, 1942

Penholders; wood E-GG-P-181a Feb 11, 1942

Pins; office E-FF-P-401a Jan 24, 1942

Punches; paper, one-hole (with and without eyelet device) E-GGG-P-846 Jan 28, 1942

Racks; pen or pencil E-GG-R-41 Jan 24, 1942

Rope  
manila (superseding E-T-R-601a, Nov 12 1941) E-T-R-601a Feb 9, 1942  
wire E-RR-R-471 Jan 24, 1942

Rulers; desk E-GG-R-791a Jan 28, 1942

Saws E-GGG-S-61 Feb 11, 1942

Squares; carpenters', die-makers', and machinists' E-GGG-S-656 Feb 16, 1942

Tape  
friction E-HH-T-101a Jan 30, 1942  
paper, gummed (kraft) E-UU-T-111 Jan 28, 1942  
rubber, insulating E-HH-T-111a Jan 30, 1942

Thread; linen (superseding E-V-T-291a, Aug 19, 1941) E-V-T-291a Feb 9, 1942

Wire, Steel; bookbinders' E-QQ-W-414 Feb 4, 1942

Wood-Preservative  
coal-tar-cresote E-TT-W-556a Jan 22, 1942  
cresote-petroleum-solution E-TT-W-558 Jan 22, 1942  
recommended treating practice E-TT-W-571b Jan 22, 1942

Wrenches; pipe E-GGG-W-651a

#### Agricultural Marketing Service (U. S. Department of Agriculture, Washington, D.C.)

Carrots with Short-Trimmed Tops

Orange Juice, Canned, Grades of



# How Brazil Develops National Standards

by Paulo Sá

*Secretary, Associação Brasileira de Normas Técnicas*

FOR many years Brazilian industrialists and technicians have tried to obtain some standardization for the products made or used in this country.

One of the most important of these attempts was made by Francisco Sá, formerly Minister of Transportation of the Federal Government, who in 1925 organized a committee to study standardization of railway materials used in Brazil. His work, however, was untimely, since the country was not yet prepared for such an undertaking.

In 1930, however, the National Institute of Technology began a new movement for standardization of materials.

Finally in 1937, through the initiative of the Institute, the First Annual Meeting of those interested in standardization was held in Rio de Janeiro with great success.

The first Brazilian Standards were approved during this meeting; and by decree the Federal Government gave official status to them.

In 1939 we had our second Annual Meeting and in 1940 our third Annual Meeting.

It was during this third meeting that the Associação Brasileira de Normas Técnicas (Brazilian Standards Association) was formally organized, with the purpose of establishing standards for materials and for their use.

## Laboratories Check Standards

The standardization work of the ABNT must always have as foundation the experimental studies of the Brazilian Laboratories in which the experience of other countries is checked and the peculiar qualities of Brazilian materials is taken into consideration. The ABNT coordinates the studies of these Brazilian laboratories, preparing parallel tests, comparing the results, and drawing general conclusions.

The ABNT has two classes of members: collective members (industrial or commercial companies, governmental entities, technical societies, laboratories), and individual members (technical or industrial people).

The Directing Council is composed of 12 members: three representing the producers, three representing the consumers, three representing the laboratories, and three representing the individual members.

The Directing Council chooses the Board of Directors from among its members.

## Brazilian Standards Procedure

The procedure for adoption of standards is as follows:

(a) The Board of Directors chooses a committee, evenly balanced between representatives of consumers, producers, and laboratories.

(b) The committee promotes studies in the laboratories about the subject which is to be standardized. These studies are controlled by the members of the committee.

(c) Taking into consideration the work done by the laboratories, and the standards of other countries, the committee prepares a draft.

(d) This draft is published for comment and criticism.

(e) The committee studies the observations received and makes a new draft.

(f) This new draft is finally submitted for the approval of the members of the ABNT. A standard to be approved must receive two-thirds of the votes of the committee.

(g) The standard approved is published as a Brazilian Standard.

The approval of standards takes place, as a rule, during the Annual Meeting of the ABNT.

The proposed standard is first taken to a meeting as a subject for deliberation; at the following meeting it is taken as a draft; and at the third meeting it is considered for approval by the Association, and if acceptable it is approved.

The Federal and the State Governments, through their representation, participate in the development of the standards, and adopt all the standards approved for the purchasing of their materials.

The ABNT has now as collective associates about 70 official organizations and more than 100 private enterprises. Its individual associates are more than 400.

*(Continued on next page)*

In its organization the ABNT is entirely independent. As one may see, this organization and also the procedure for the adoption of standards is very different from the organization and the procedure adopted by the Argentine IRAM although the most friendly and cooperative relations exist between the two organizations.

The ABNT has already adopted about 30 national standards, including the Brazilian Electrical Code and the Code for Reinforced Concrete.

Last October representatives from the South American standards associations (including the

IRAM) met in Rio de Janeiro at the offices of the ABNT to study the organization of a South American Committee of Standardization.

This preliminary committee adopted, with some modifications, the by-laws for the new organization proposed by the Brazilian representatives. The South American Committee, although it will not have a permanent headquarters, will be made up of three representatives from each South American country, these representatives to be nominated by the national standardizing association in each country.

## General Council Will Coordinate British Standards Activities

Le Maistre Heads Council; Good  
Becomes BSI Director

The continuing expansion of the work of the British Standards Institution, and its relations with Government departments and standardizing authorities in other countries, has resulted in appointment of an Executive Committee with a full-time chairman to review and coordinate all the activities of the Institution. C. le Maistre, formerly Director and Secretary of the Institution, has been named as the first full-time chairman of the committee. Percy Good, who was recently named Associate Director of the BSI, replaces Mr. le Maistre as Director and Secretary of the Institution.

The Executive Committee consists of the following:

The chairman of the General Council, ex officio

A full-time chairman who shall not, ex officio, be a member of the BSI General Council

The chairman of the Divisional Councils of the BSI (Building, Chemical, Engineering, and Textile)

The chairman of the Finance Committee

The chairman of the Mark Committee

A representative of the Department of Scientific and Industrial Research

A Government representative, appointed if the Government so desires and in such manner as it deems appropriate

A nominee by The Institution of Civil Engineers on behalf of the Founder Institutions of the original Engineering Standards Committee

Not more than three co-opted persons with experience in industry and with the work of the Institution, who shall hold office for three years.

This Executive Committee replaces the Chairman's Advisory Committee, and will be expected to report to the General Council from time to time as may be necessary.

Importance of the war-time program of the BSI to the British war effort is indicated in the fact that the War Emergency British Standard Schedule of Sizes for Tins and Cans alone is estimated to have saved 40,000 tons of steel in the first year.

## Regional Committee Urges Minimum Standards for Motor Vehicle Laws

The Northeastern Regional Committee on motor truck problems in its report to the Seventh Northeastern Regional Highway Safety Conference in New York recently recommended minimum motor vehicle sizes and weights as follows:

- (1) permissible width—96 inches.
- (2) permissible height—12½ feet.
- (3) permissible length of single vehicle—35 feet.
- (4) permissible length of a combination—45 feet.
- (5) permissible weight per inch width of tire—600 pounds.
- (6) permissible weight on single axle—1800 pounds.
- (7) permissible weight on two axles—30,000 pounds.
- (8) permissible weight on three axles—40,000 pounds.
- (9) permissible weight of semi-trailers—40,000 pounds.
- (10) permissible weight of other combinations—40,000 pounds.

On the basis of standards agreed upon, 15 changes are recommended in motor vehicle size and weight laws in Pennsylvania, New Jersey, Massachusetts, Connecticut, Maine, New Hampshire, Vermont and Delaware.

State Commissions on Interstate Cooperation in the Northeastern states, are urged to sponsor specific legislation necessary in each state for adoption of the approved standards to promote the free flow of interstate traffic.

# How Great Britain Standardizes To Meet War-Time Needs

GREAT BRITAIN'S experience in standardizing products used by British consumers in order to release her productive facilities for war needs is told by *Business Week's* London correspondent in the February 28 issue of *Business Week*. In rounding up the story of standardization in relation to the war efforts the reporter concludes, however, that, "while United States consumer industries are anxiously watching Britain and Canada for signs of what may happen to proprietary manufacturers and distributors in the war emergency, executives in the heavy industries know that they are more likely to get their tips on war-time standardization from Germany where Hitler long ago started to put the war-time touch on America's own mass-production technique."

"Canada took the lead among the democracies in adopting this drastic German pattern," *Business Week* points out, "when Ottawa last week set up a special division in its Wartime Prices and Trade Board to work out immediately plans for standardized goods in all consumer lines. It's too early to tell how far the plan will go."

In Great Britain standardization of clothing materials, food products, gasoline, and furniture as well as standardization of materials used in heavy industry production, has been found to be essential.

"Utility clothing" was first planned last September when the British government set up a Directorate of Civilian Clothing to establish standards for "utility cloth" and to see that materials for fixed quantities of it were provided when raw materials were allocated. Standardized work clothing—overalls, cheap cotton slacks, and a denim-like overall and jacket—were on the market in a short time. By January of 1942, women's tailored suits of "utility" tweed were on sale, and the first men's suits made from the new "utility" cloth had been promised for February sale.

## Cloth, Not Style, Is Standardized

The cloth alone, not the style or the color, is standardized, to the extent that it must contain fixed proportions of wool and must sell at controlled prices which limit the margin of profit from manufacturer to retailer.

"For the nine months ending in May, 30 per cent of the country's wool supply will go to

**Attempts to satisfy requirements of British people include standards for clothing, food, furniture, and gasoline**

manufacturers of utility fabrics, and only 15 per cent for general purposes (the balance is absorbed by the army or for other household items)," *Business Week* reports. "A full 20 per cent of other textile materials is allocated for utility items; and 9 per cent for general purposes. Quota of knitted material for utility items is double that for general use."

## "Pool Petrol" Is Standard Gasoline

Gasoline was Britain's first wartime standardized product. As soon as war broke out, all gasoline distributors were ordered to pool their supplies, and to offer only one grade to the public. This was particularly necessary in Great Britain because the British are entirely dependent on imports. Plans to ration gasoline were drawn up long before the war started. By September 16, 1939, "high test," "anti-knock," and "ethyl" gave way to "Pool Petrol." For the duration of the war, all companies will sell a single grade of gasoline.

The first move to standardize food products was made in October, 1939, when the Ministry of Food took full control of the margarine and cooking-fat industry. For these products, too, Great Britain relies largely on imports. The standardization program as applied to margarine has had a history of both success and failure. When the Ministry of Food first ordered that for the duration all margarine and cooking fat be manufactured to one standard and sold in a plain wrapper, it looked as though all individual brands might be doomed.

"Results were encouraging, as far as the government was concerned," *Business Week* reports. "Production soared, without any comparable increase in the cost of raw materials, which were simply spread over a greater output of a medium-quality product. Handling was simplified because there were no longer a dozen different brands to keep stocked, and the price was the same everywhere."

The scheme failed, however, because the supply crisis did not become as serious as had been expected, and because the officials "made the mistake of setting the price of the single quality margarine too high for the mass market." Within six weeks, the "national margarine" plan was dropped and most of the old trade names reappeared on the market.

However, with the fall of Denmark and occupation of Holland, with consequent loss of Britain's main butter supplies, the problem became acute, and again standard margarine was adopted. This time, however, manufacturers abandoned their proprietary products "voluntarily." "At least," reports *Business Week*, "the government—with full control of raw materials imports—suggested that they do the job themselves in the way that would come nearest meeting the complaints against the first trial."

"Within the last few weeks Canada's price-control authorities have begun to run into trouble caused by a lack of standardization of products. The problem arose because of the difficulty of fixing prices equitably on the wide range of styles and qualities of products that exist in the country, and because of the lack of uniformity of packages. It is the same problem that the British encountered when they first introduced price controls and instituted rationing.

"But Canada's Price Control Administration is tackling the problem in an altogether practical way. From the beginning of the control program on December 1, the Gordon Board has been strongly urging standardization of styles and models to relieve pressure on profits and to enable manufacturers and distributors to overcome the squeeze, and they have told executives as much. But so far manufacturers have been reluctant to abandon long-advertised trade marks and popular models in favor of some 'utility' model which the entire trade will turn out according to a standardized pattern. Control authorities insist that pressure will be used soon unless some steps in this direction are taken voluntarily."

—*Business Week*, February 7.

As a result all resources for the entire industry were pooled in the second trial. All brand names were dropped. Instead of a single grade of margarine, however, the voluntary pool agreed on two grades—"standard" to sell at the customary five pence a pound to the cheap market, and "special" to sell at nine pence for the higher market. Standards were set for each type, and both qualities contained Vitamins A and D.

#### Sales Organizations Represents Industry

In addition, a selling organization, Marcom Ltd, was formed to represent the entire industry and to act as selling agent to the Ministry of Food, now the country's biggest buyer. The big margarine companies continue to advertise and to run an advice campaign on the most economical use of their product. Their business is up, and their main worry is not selling, but acquiring ingredients for margarine.

Other more or less successful plans for standardizing food products covered tea (never enforced because of the public's demand for special blends), bread (unpopular with bakers and not widely accepted); candy bars (of 300 different types, only 20 remained at the end of last year, and 90 per cent of future production must be in the cheaper types); and soup (rigid standards as to sizes and contents are now used for five types of soup for use in emergency feeding stations and for distribution to air raid shelters).

"Emergency distribution by the Food Ministry is now on such a large scale that any standardized products it creates are bound to make a profound impression on the whole British market," *Business Week* reports. The cans now are all marked with the Ministry of Food label and do not carry the name of the manufacturer, although the soups have proved so popular that individual manufacturers have asked to be allowed to produce some of each type under their own brand names for the general market.

#### Steel Specifications Reduced

In the heavier consumer-goods lines and in the construction industry, steel specifications have been reduced from 2,000 to 58; brick sizes have been reduced from 17 to two. Government orders for a single-style table, chair, cupboard, chest, and wardrobe closet to offer to blitzed families have virtually standardized whole sections of the furniture industry. Government departments have been forced to reduce the 150 kinds of electric cables normally used to less than 30. Radio tubes have been voluntarily standardized by the industry.

"The real job of wartime standardization," *Business Week* points out, however, "is being



done in Germany. This is really nothing but America's mass-production methods ruthlessly spread to every field of production by a totalitarian government fully aware that its one chance of winning the war is to outproduce the democracies. And it could hope to do this only (1)

by getting a head start, and (2) forcing every possible machine to turn out war equipment. Civilian goods were regimented months ago and relegated to the smallest possible number of machines that could turn out minimum requirements."

## New Foreign Standards Received by ASA Library

The following new and revised standards have been received recently by the American Standards Association from Australia and Canada, and may be borrowed by ASA Members from the ASA Library.

### Australia

Australian Draft Standard (Latest date for receipt of comments: May 31, 1942)

Fungicides and Pest Destroyers, together with methods of Sampling and Analysis (To be No. K83)

### Canada

Canadian Electrical Code, Part II—Construction and Test of:

Service-Entrance and Branch-Circuit Breakers 2nd ed C22.2—No.5—1942 60¢

Electric Fixtures 2nd ed C22.2—No.9—1941 75¢

Fractional-Horsepower Electric Motors for other than Hazardous Locations 2nd C22.2—No.11—1942 50¢

Cord Sets 2nd ed C22.2—No.21—1941 50¢

Integral-Horsepower Electric Motors for other than Hazardous Locations 1st ed C22.2—No. 54—1942 50¢

Snap Switches 1st ed C22.2—No.55—1942 60¢

Specialty Transformers (Miscellaneous and General-Purpose; Bell-Ringing; Toy) 1st ed C22.2—No.66—1942 75¢

Portable Electric Vacuum Cleaners 1st ed C22.2—No.67—1942 50¢

Motor-Operated Appliances—Domestic and Commercial (Fractional Horsepowers) 1st ed C22.2—No.68—1942 50¢

Electrically Equipped Machine Tools 1st ed C22.2—No.73—1941 50¢

## Conservation Bureau Asks ASA Members to Save Scrap

The American Standards Association has been asked by the Industrial Salvage Section of the Bureau of Industrial Conservation, in Washington, to request our members to take an immediate, active part in the campaign to round up scrap materials needed for our war effort.

The Bureau of Industrial Conservation is charged with the responsibility of developing salvage programs for waste materials, especially iron and steel scrap, non-ferrous metals, cotton

and woolen rags, paper and rubber, wherever they can be found throughout the land.

The Bureau suggests the following program:

1. Put some one responsible individual in charge of salvage throughout *all* departments of your business and give him authority to organize and start at once an emergency "clean up" campaign, to be followed with a permanent salvage organization.
2. Devise an effective method of bringing the message of conservation to *all* of your employees every day.
3. Build into your plan a program to keep it alive. Don't let initial enthusiasm die. This is a continuous job.
4. Act *now*.

Please advise the Bureau of Industrial Conservation of any action your company takes.

## Price Order on Sheets Is Pegged To Standards Based on ASA Work

The OPA in its recent price schedule on bed linens has started what may be a new trend in setting price ceilings for various widely used commodities. It has done this by pegging the prices to a schedule of standard specifications which indicate the thread count per square inch, weight per square yard, tensile strength, number of stitches per inch, etc., of the four classifications of sheeting covered. Sheeting which falls below the specifications for the type and class in which it lies must be sold and labeled as sub-standard. The government order further requires that each sheet, piece of sheeting, or pillow case must bear a label giving the type and size.

The labels are carried through the wholesaler to the retail outlet. The OPA does not, however, explicitly require that the labels appear on the individual sheets purchased by the ultimate consumer, although many retailers will leave the labels on the sheets sold over the counter. In the latter case the purchaser will not only be protected from undue increases in the cost of sheets but through the specifications will also be protected from hidden cuts in quality.

The standards to which this price order are

pegged by the OPA are practically identical to recommendations on sheets and sheeting now being considered by a committee of the American Standards Association, but which have not yet been approved as an American Standard. The chief differences between this order and the recommendations before the ASA committee lie in the amount of sizing permitted. The ASA committee, made up of sheeting manufacturers, retailers, finishers, consumer representatives, etc., constitutes a good cross-section of all groups interested in sheets and sheeting.

Work of other ASA committees has been used by the Federal Trade Commission, the Interstate Commerce Commission, and other governmental agencies.

The case of sheets is the first time that the OPA has pegged a price order to actual standards.

## Automobile Manufacturers Name Romney as General Manager

The appointment of George Romney as general manager of the Automobile Manufacturers Association was announced March 6 by Alvan Macauley, president. Mr. Romney has been Detroit manager of the association for several years and recently became managing director of the Automotive Council for War Production. He succeeds Pyke Johnson who resigned to become president of the Automotive Safety Foundation.

Although responsibility for the war effort has been taken over by the Automotive Council "the structure of AMA will be continued intact" to permit re-entry of manufacturers "promptly into any field when conditions permit," the association announces.

# ASA Standards Activities

## Standards Available Since Our February Issue

- Carbon-Steel Castings for Valves, Flanges, and Fittings for High-Temperature Service (ASTM A95-40) (Revision of G17.1-1940) American Standard G17.1-1942 25c
- Concrete Masonry Units for Construction of Catch Basins and Manholes (ASTM C-139-39) American Standard A73.1-1942 25c
- Drinking Fountains (Revision of Z4.2-1935) American Standard Z4.2-1942 10c
- Laundry Machinery and Operations, Safety Code Z8-1941 5c
- Letter Symbols for Hydraulics (Revision of Z10b-1929) American Standard Z10.2-1942 35c
- Letter Symbols for Mechanics of Solid Bodies (Revision of Z10a-1932) American Standard Z10.3-1942 25c
- Rubber Products, Methods of Sample Preparation for Physical Testing of (ASTM D15-41) American Standard J11.1-1942 25c
- Screw Thread Gages and Gaging American Standard B1.2-1941 60c
- Tubular Sleeving and Braids, Methods of Testing and Tolerances (ASTM D354-36) (Revision of L13-1941) American Standard L13.1-1942 25c
- Vulcanized Rubber:
  - Methods of Tension Testing of (ASTM D412-41) American Standard J2.1-1942 25c
  - Methods of Test for Adhesion of (Friction Test) (ASTM D413-39) American Standard J3.1-1942 25c
  - Methods of Test for Accelerated Aging of, by Oxygen-Pressure Method (ASTM D572-41) American Standard J4.1-1942 25c
  - Methods of Test for Accelerated Aging of, by Oven Method (ASTM D573-41) American Standard J5.1-1942 25c

## Standards Approved Since Our February Issue

- Cast-Iron Screwed Drainage Fittings American Standard B16.12-1942

## Standards Approved—(Continued)

- Illuminating Engineering Nomenclature and Photometric Standards (Revision of Z7-1932) Z7.1-1942
- Wire and Cable
  - Specifications for Type SB (Slow Burning) Wire and Cable American Standards C8.9-1942
  - Specifications for Impregnated Paper Insulation of Solid Type for Lead-Covered Power Cable American Standard C8.10-1942
  - Specifications for Cotton Braid for Insulated Wire and Cable for General Purposes American Standard C8.12-1942
  - Specifications for Varnished Cloth Insulation for Lead-Covered or Braid-Covered Power Cable American Standard C8.13-1942
  - Specifications for Metallic Coverings for Insulated Wire and Cable American Standard C8.15-1942

## Approval of Standard Withdrawn

- Weatherproof (Weather Resisting) Wires and Cables (C8k1-1932)

## Standards Being Considered by ASA for Approval

- Adjustable Face Traffic Control Signal Head Standards
- Brick (Modulus of Rupture, Compressive Strength, Absorption, Freezing and Thawing), Methods of Testing (ASTM C67-41)
- Cast-Iron Pipe Flanges and Flanged Fittings, Class 250 (Revision of B16b-1928)
- Concrete Masonry Units (ASTM C140-39)
- Concrete Building Brick (ASTM C55-37)
- Elevators, Safety Code (Supplement to 1937 ed)
- Hollow Load-Bearing Concrete Masonry Units (ASTM C90-39)
- Hollow Non-Load-Bearing Concrete Masonry Units (ASTM C129-39)
- Jacks, Safety Code B30
- Keyways for Holes in Gears B6.4
- Lighting Factories, Mills and Other Work Places (Revision of A11-1937)

#### Standards Being Considered (Cont'd)

- Limestone, Quicklime, and Hydrated Lime, Methods of Chemical Analysis of (ASTM C25-29)
- Metallic Coverings for Insulated Wire and Cable (Revision of C8.15-1938) C8.15
- Protection of Structures Containing Inflammable Liquids and Gases—Part 3 of Code for Protection Against Lightning (From status as American Tentative Standard to American Standard) C5, Part 3
- Public Approval and Certification Procedures Z34
- Quicklime for Structural Purposes, Specifications for (ASTM C5-26)
- Rotating Electrical Machinery on Railway Locomotives and Rail Cars and Trolley, Gasoline-Electric and Oil-Electric Coaches (Revision of C35-1936) C35
- Rubber Gloves for Electrical Workers (ASTM D120-40) C59.12
- Sand-Lime Building Brick (ASTM C73-39)
- Solid Load-Bearing Concrete Masonry Units (ASTM C145-40)
- Standard Machine-Tool Gray "7 B"
- Structural Clay Floor Tile (ASTM C57-39)
- Structural Clay Load-Bearing Wall Tile (ASTM C34-41)
- Structural Clay Non-Load-Bearing Tile (ASTM C56-41)
- Structural Clay Tile, Methods of Testing (ASTM C112-36)
- Structural Steel, Building Code Requirements
- Textile Testing Machines (ASTM D76-41)
- Use of Explosives in Anthracite Mines, Proposed American Recommended Practice M27
- Wool Felt, Methods of Testing (ASTM D461-40)

#### Standards Being Considered Since Our February Issue

- Acoustical Measurements and Terminology
  - Acoustical Terminology (Revision of Z24.1-1936)
  - Noise Measurement (Revision of Z24.2-1936)
- Cast Iron
  - Cast-Iron Culvert Pipe (ASTM A 142-38)
  - Gray-Iron Castings (ASTM A48-41)
  - Lightweight and Thin-Sectioned Gray-Iron Castings (ASTM A190-40)
- Cast-Iron Screwed Drainage Fittings B16.12
- Gas-Burning Appliances
  - Approval Requirements for Refrigerators Using Gas Fuel
  - Listing Requirements for Gas Appliance Connectors of Flexible Metal Tubing and Fittings
- Copper Wire
  - Hot-Rolled Copper Rods for Electrical Purposes (ASTM B49-39) H4.7
  - Soft or Annealed Copper Wire (ASTM B3-39) H4.1
- Materials for Boilers, Pressure Vessels, etc.
  - Boiler Rivet Steel and Rivets (ASTM A31-40)
  - Carbon-Silicon Steel Plates of Ordinary Tensile Ranges for Fusion-Welded Boilers and Other Pressure Vessels (ASTM A201-39)
  - Carbon-Steel Plates for Stationary Boilers and Other Pressure Vessels (ASTM A 70-39)
  - Chrome-Manganese-Silicon (CMS) Alloy-Steel Plates for Boilers and Other Pressure Vessels (ASTM A202-39)
  - High-Tensile Strength Carbon-Silicon Steel Plates for Boilers and Other Pressure Vessels (Plates 4½ In. and Under in Thickness) (ASTM A212-39)

#### Materials for Boilers (Cont'd)

- Low-Carbon Nickel-Steel Plates for Boilers and Other Pressure Vessels (ASTM A204-39)
- Low Tensile Strength Carbon-Steel Plates of Flange and Firebox Qualities (ASTM A89-39)
- Molybdenum-Steel Plates for Boilers and Other Pressure Vessels (ASTM A204-39)
- Structural Materials, Concrete Reinforcement, and Flange and Bolting Materials
  - Alloy-Steel Castings for Valves, Flanges, and Fittings for Service at Temperatures from 750 to 1100 F (ASTM A 157-41)
  - Axle-Steel Bars for Concrete Reinforcement (ASTM A160-39)
  - Carbon and Alloy-Steel Nuts for Bolts for High-Pressure and High-Temperature Service to 1100 F (ASTM A 194-40)
  - Forged or Rolled Alloy-Steel Pipe Flanges, Forged Fittings, and Valves for Service at Temperatures from 750 to 1100 F (ASTM A 182-40)
  - High-Strength Structural Rivet Steel (ASTM A 195-41)
  - Low Tensile Strength Carbon-Steel Plates of Structural Quality for Welding (ASTM A 78-40)
  - Structural Silicon Steel (ASTM A94-39)
  - Structural Steel for Locomotives and Cars (ASTM A113-39)
  - Welded Steel Wire Fabric for Concrete Reinforcement (ASTM A185-37)

#### New Project Being Considered

- Performance of commercial dishwashing machines, and practice for dishwashing operation

#### Withdrawal of Approval Being Considered

- Methods of Testing Cement (ASTM C77-32) A1.2-1933
- Specifications for Portland Cement (ASTM C9-30) A1-1931

#### Draft Standard Available

- Bare and Metallic Coated Round Wire Proposed American Standard B32

### Defense Emergency Standards

#### Standards Under Way

- Allowable Concentration of Ether Z37
- Allowable Concentration of Manganese Z37
- Allowable Concentration of Xylol Z37
- Automatic Refrigerators B38
- Color, Specification and Description
- Color Fastness of Textiles, Terminology
- Control Chart Method of Controlling Quality During Production Z1.3
- Denim and Broadcloth, Definitions
- Domestic Washing Machines
- Machine Tool Electrical Standards
- Photographic Exposure Guides
- Protective Lighting of Industrial Plants

#### Requests for Emergency Projects Being Considered

- Graphical Symbols for Electric Power, Control and Measurement Z32.3
- Graphical Symbols for Telephone, Telegraph, and Radio Use
- Percalé Sheets, Definitions

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